

REMARKS

It is to be noted that the formula for displaced volume as found on line 33 of page 1 and line 18 of page 3 were correct as submitted in the application, but were incorrect as published.

The proposed drawing is submitted herewith. This drawing does not include any material not previously submitted, either in the specification or the claims.

With respect to claim rejections under 35 U.S.C. 112, the rejections of claims 3-16 and 22, 28-30 have been obviated by the enclosed drawing and descriptive material.

Rejection of Claims 20-22, based upon 35 U.S.C. 112, is incorrect in that the basis for the claims is found on page 11, first paragraph.

Rejection of Claims 5-9, 11, 12, based upon 35 U.S.C. 112, have been obviated by amendment or are obvious from understanding of basic magnetic principles. The citation to a text will be provided if necessary. Basically, ferromagnetic material has a higher permeability than air and thereby diverting flux to the two or more narrow regions, thereby creating two or more regions of higher magnetic field intensity.

Further, with respect to Claims 20-22, non-magnetic materials would still allow magnetic flux to be steering around the partially or fully filled grooves or other areas in which these materials are placed. Varying degrees of flux leakage occurs due to the relative permeability of the material.

In particular, paramagnetic materials would allow diversion of a small amount of flux, due to a low, but not unitary, relative permeability, while non-magnetic materials would act similarly to air in limiting flux leakage, and diamagnetic materials would actively prevent flux diversion due to relative permeabilities less than that of air.

All of the claims, with the exception of Claim 7 have been rejected either under 35 U.S.C. 102 or 35 U.S.C. 103, utilizing the reference to Zwicky.

The examiner's attention is directed to column 6, lines 9-11 of Zwicky, wherein he states "It is preferable to arrange such first [saturated] sections 22 within the pole piece 12, but not in close proximity to the air gap 15." In contrast, the

region of reduced cross sectional area in the present invention is specifically in the region of the air gap, and in fact, in the very middle of the air gap, and is therefore, clearly not anticipated by Zwicky in any way. The application further states that the rebates (grooves) lie on either side of the coil and include one in the top plate opposite that in the pole. Zwicky teaches nothing even distantly similar to this. Further, the present invention can also be combined with other regions of reduced area, permanence or resistivity such as those described in Zwicky, but operate independently of such additional features.

The application describes the regions of increased magnetic field in the air (gap), while Zwicky explicitly claims that the air gap 15 cannot be magnetically saturated (Column 5, lines 1 and 2.)

The present invention is further distinguished from Zwicky in that because of the way magnetic flux flows, of the flux flowing up the pole towards the two gaps, a significant fraction is shunted back to the opposing face of the air gap before ever reaching the restricted region, leaving too little flux to saturate the rebated region between the two gaps, and therefore, preventing it from ever approaching operation in an manner related to that described by Zwicky. Saturation of the constricted intergap region in the present invention would in all cases prevent operation, since we claim that the two regions of higher intensity of similar magnitude, saturation would at most involve cases cause imbalance between the two more intense regions. The magnetic fields of lower and higher intensity regions of Zwicky are specifically in the solid of the central pole piece, flowing in an axial direction and displaced from each other, all in the direction of the magnetic field. The field claimed in our invention is in the area of the air gap, not in the solid pole. The flux of these fields flowing in a radial direction not axial and displaced from each other perpendicular to the flux flow in the channel fields.

The present invention creates an area of lower field intensity. Similar directions between the two higher field gaps by lengthening the distance the field must traverse through the

air in the lower field region by creating the grooves (rebates) in the magnetic material and thus widening the central gap section, thus increasing the reluctance (resistance to flux flow) and thereby reducing the field strength in the region. This effectively steers the flux from the magnetic towards the narrower gap regions above and below our grooves. This can also be described in reverse. The present invention creates the same two (or more) higher field regions between lower field regions by extending the lips of the magnetic material out towards each other radially. In either case, the flux from the permanent magnet(s) preferentially traverses the path of least resistance and in proportion to the magnetic permanence ( $1/\text{reluctance}$ ) of these paths akin to Ampere's Law,  $I=V/R$ . The invention creates two or more gaps of low magnetic reluctance between regions of higher reluctance. Air has a very low permeability to magnetic flux, therefore retarding its flow, while paramagnetic and ferromagnetic materials have higher and much higher permeabilities (respectively), allowing use of this differential to steer the flux towards the claimed two or more narrow air gaps by placing the magnetic materials wherever it is desired to have flux flow, i.e., towards the narrow gaps and moving it from where flux is not desired. Magnetic material can be ferromagnetic, permanent magnet or even paramagnetic and combinations thereof, while non-magnetic and diamagnetic materials such as copper and aluminum have essentially similar permeabilities to air and can be placed in or substituted for any region devoid of magnetic materials or for air.

Claim 23 has been amended to make it clear that the grooves are not filled with the same steel as elsewhere. It is to be remembered that the present invention operates in parallel, whereas Zwicky operates in series.

Claims 34-36 have been added to replace and clarify the language of deleted Claim 2.

Thus, as can be seen, Zwicky not only does not anticipate the present invention, but in fact teaches away from the present invention.

It is urged that the application of Zwicky to anticipate the present claims is in error and it is urged that this objection be withdrawn.

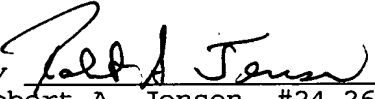
It is believed that the present application is in condition for allowance, and notice thereof is respectfully solicited.

This is to request a 3-month extension of time. Enclosed is our check for \$490. .

The Commissioner is authorized to charge any deficiency or credit any over payment to Deposit Account 07-1900.

Respectfully submitted,

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